REMARKS

Claims 1-3, 5-22 and 48-58 are pending. Applicants note that in the Office Action Summary, it is set out that claims 1-22 and 48-58 are pending. However, in Applications response filed on July 2, 2008, claim 4 was canceled. Claims 1, 50, and 58 are amended herein, claims 59-60 are added, and claim 49 is canceled without prejudice. No new matter has been added by virtue of the amendments, support for the amendments being found in the original claims, the Examples, and throughout the originally filed specification, claims, and figures.

1. 35 U.S.C. §112 Rejections

Claims 1-22, 48 and 49 are rejected under 35 U.S.C. §112, second paragraph as being indefinite because the limitation "the difunctional acrylate molecule" in line 4 has insufficient antecedent basis. Applicants have corrected this typographical error to refer to "the difunctional surface-modifying molecule". Reconsideration and withdrawal of the rejection is respectfully requested.

Claim 6 is rejected under 35 U.S.C. §112, second paragraph. The Office asserts that claim 6 includes PEGDA which "is not capable of significant *preferential* absorption on a substrate as shown in the present specification (example 2 at page 19 of the present specification)" and, thus, claim 6 allegedly is in conflict with claim 1. Applicants respectfully traverse.

As set forth in Example 2, which is relied upon by the Office, "polyethylene glycol (400) diacrylate (Sartomer SR 344) is a totally hydrophilic molecule, and is not capable of a significant, preferential adsorption on the phobic substrate" (see the present Application - U.S. Published Application No. 2004/0242714 at [0087]). Thus, Applicants set out in the disclosure that Sartomer SR 344, which is polyethylene glycol (400) diacrylate, is totally hydrophilic and is not capable of significant preferential adsorption.

Claim 6, however, recites a membrane wherein the "hydrophobic portion is a hydrophobic alkyl, aromatic group, or olefinic hydrocarbon group." As set forth in Applicants' disclosure, suitable hydrophobic groups include olefinic hydrocarbon groups (see Summary of

the Invention, second paragraph; U.S. Published Application No. 2004/0242714 at [0012]). It is shown in Example 2 that PEGDA (one material containing an olefinic hydrocarbon), in particular, does not demonstrate significant preferential absorption. However, it is not set out that all materials containing an olefinic hydrocarbon are incapable of preferential absorption – only that this one particular material does not demonstrate this property because both carbon atoms in this particular molecule are situated next to oxygen atoms (-O-CH2-CH2-O-), this leads to the electronic density shift and makes the molecule totally hydrophilic.

Thus, claim 6, which sets out that the hydrophobic portion of the difunctional surface-modifying molecules can be an olefinic hydrocarbon group is not in conflict with claim 1 – there are materials other than PEGDA that do exhibit preferential absorption. Reconsideration and withdrawal of the rejection is respectfully requested.

2. 35 U.S.C. §102/103 Rejections

Callahan

Claims 1-19, 21, 22, 48-52, and 55-57 are rejected under 35 U.S.C. §102(b) or alternatively §103(a) over Callahan et al (U.S. Patent No. 4,976,897). Applicants respectfully traverse.

Without agreeing with or acquiescing to the rejections, claims 1 and 50 have been amended to recite that the composite porous membrane comprises a hydrophobic substrate having an average pore size ranging from about 0.01 μm to about 10 μm coated with difunctional surface-modifying molecules, wherein the substrate is coated by flowing a reagent solution (comprising the difunctional surface-modifying molecules and a photoinitiator) through the substrate to coat the substrate – as such, the reagent solution is capable of flowing through the substrate. As further set forth in the claims, the pore sizes of the coated composite porous membrane is substantially the same as the pore size of the composite porous membrane before coating.

It is respectfully submitted that Callahan clearly does not teach or suggest Applicants composite porous membranes as claimed in claims 1 and 50.

The Office points to Callahan's use of Celrad 3700-20T, which is a composition of 20% trimethoyl triacrylate dilution of diacrylate ester bisphenol A epoxy resin, and that both of these materials are difunctional surface modifying molecules and crosslinkers (see Office action on page 4). However, as set forth in Table 1, Celrad 3700-20T has a viscosity of 72,000 cp. Callahan uses such high viscosity materials as the method for solving prior problems of low flux through coated membranes. In particular, according to Callahan, materials having high viscosities are used which prevents the resins from wicking up or passing into the pores (see col. 2, lines 50-65; col. 4, line 54 – col. 5, line 7; col. 6, lines 54-58; col. 8, lines 1-5).

Callahan's solutions for coating porous substrates, which have viscosities of at least 35,000 cp, preferably from 50,000-500,000 cp, are not capable of flowing through a porous substrate having a pore size ranging from about 0.01 μm to about 10 μm because Callahan's materials are much to viscous. Applicants further submit that even if Callahan's solutions are, to some extent, forced through the pores at all, such highly viscous materials would block the pores and would, in no case, provide a coated porous membrane wherein the pore sizes of the coated porous membrane is substantially the same as the pore size of the porous membrane before coating.

Further, contrary to the Office's assertions at page 4-5 of the Office action, Callahan's coating materials are very different than those taught and claimed by Applicants, and such materials do not meet all the structural limitations and chemistry as described in Applicants' claims. Callahan's coated membranes, coated with Callahan's solutions, thus, would clearly not provide coated membranes in accordance with Applicants' claims because Callahan's coating solutions are different than Applicants' coating solutions, and because Callahan's coated membranes do not contain any surface-modifying material on the inner surface of the pores.

In view thereof, it is respectfully submitted that claims 1 and 50, and all claims dependent therefrom, are patentable over Callahan. Reconsideration and withdrawal of the rejection is respectfully requested.

Callahan and Steuck

Claim 20 is rejected under 35 U.S.C. §103(a) over Callahan and Steuck et al (U.S. Patent No. 4,618,533). Applicants respectfully traverse.

Steuck does not remedy the above-noted deficiencies in Callahan. Rather, Steuck is cited for allegedly describing porous membranes that include polyethylene and polyvinyldiene fluoride. No combination of Callahan and Steuck would teach or suggest Applicants' coated membranes as set forth in Applicants' independent claim 1. Claim 20 depends from claim 1 and, thus, also is patentable over Callahan and Steuck. Reconsideration and withdrawal of the rejection is respectfully requested.

Witham et al.

Claims 1-9, 12-17, 19, 21, 22, and 48-58 are rejected under 35 U.S.C. §102(b), or alternatively §103(a) over Witham (U.S. Patent No. 6,193,077). Applicants respectfully traverse.

Witham describes a membrane having a coating thereon so as to impart permanent wettability without cracking. To provide these properties, the coating requires both a high molecular weight polyalkylene oxide (PEO) and a polymerizable polyfunctional monomer. The high molecular weight PEO has molecular weights of about 25,000 to 1,000,000 daltons or greater (see col. 4, lines 30-38). According to Witham, when a dry membrane is used, the concentration of polyfunctional monomer is about 0.1 to about 1 wt%, and the concentration of polyalkylene oxide is from about 0.25 to about 1 wt% (see col. 5, lines 17-25). When a wet membrane is used, the concentration of polyfunctional monomer is about 0.1 to about 0.7 wt%, and the concentration of polyalkylene oxide is from about 1 to about 3 wt% (see col. 5, lines 26-35).

On the other hand, Applicants teach a composite porous membrane comprising a hydrophobic substrate having an average pore size ranging from about 0.01 μm to about 10 μm coated with difunctional surface-modifying molecules, the difunctional surface-modifying molecules consisting of a difunctional acrylate monomer, wherein the difunctional acrylate monomer comprise greater than about 90% of the molecules associated with the membrane.

Clearly, Witham's coating compositions, which comprise both a high molecular weight polyalkylene oxide (PEO) and a polymerizable polyfunctional monomer as set forth above, could not provide a coating wherein a difunctional acrylate monomer comprises greater than 90% of the molecules associated with the membrane, as recited in Applicants independent claim 1.

Further, Witham's coating compositions, which comprise the high molecular weight PEO and polymerizable polyfunctional monomer set forth, would not be capable of flowing through a porous substrate having a pore size ranging from about 0.01 μm to about 10 μm. Rather such coating compositions having such high molecular weight materials would be incapable of flowing through such small pore sizes. Applicants further submit that even if Witham's solutions are, to some extent, forced through the pores at all, such high molecular weight materials would block the pores and would, in no case, provide a coated porous membrane wherein the pore sizes of the coated porous membrane is substantially the same as the pore size of the porous membrane before coating.

In view thereof, it is respectfully submitted that claims 1 and 50, and all claims dependent therefrom, are patentable over Witham. Reconsideration and withdrawal of the rejection is respectfully requested.

Witham, further, at least does not teach or suggest a composite porous membrane consisting essentially of a hydrophobic substrate coated with ethoxylated (30) bisphenol A diacrylates, each ethoxylated (30) bisphenol A diacrylate comprising a hydrophobic portion preferentially associated with the substrate and a hydrophilic portion, wherein the ethoxylated (30) bisphenol A diacrylates are crosslinked to form a crosslinked hydrophilic polymeric network at the surface of the membrane, as recited in independent claim 58.

As set forth, Witham's coating compositions require both a high molecular weight polyalkylene oxide (PEO) and a polymerizable polyfunctional monomer in order to impart permanent water wettability to Witham's membranes without restricting flow rate and without cracking.

Thus, claim 58 is patentable over Witham. Reconsideration and withdrawal of the rejection is respectfully requested.

Witham and Steuck

Claim 20 is rejected under 35 U.S.C. §103(a) over Witham and Steuck et al (U.S. Patent No. 4,618,533). Applicants respectfully traverse.

Steuck does not remedy the above-noted deficiencies in Witham. Rather, Steuck is cited for allegedly describing porous membranes that include polyethylene and polyvinyldiene fluoride. No combination of Witham and Steuck would teach or suggest Applicants' coated membranes as set forth in Applicants' independent claim 1. Claim 20 depends from claim 1 and, thus, also is patentable over Witham and Steuck. Reconsideration and withdrawal of the rejection is respectfully requested.

Witham and Hu

Claims 18 and 50-57 are rejected under 35 U.S.C. §103(a) over Witham and Hu et al. (U.S. Patent No. 5,209,849). Applicants respectfully traverse.

Hi does not remedy the above-noted deficiencies in Witham. Rather, Hu is cited for allegedly describing the use of DROCUR® 1173 as a photoinitiator. No combination of Witham and Hu would teach or suggest Applicants' coated membranes as set forth in Applicants' independent claims 1 and 50. Claims 18 and 51-57 depend from claims 1 and 50 and, thus, also are patentable over Witham and Hu. Reconsideration and withdrawal of the rejection is respectfully requested.

Witham and Wu

Claim 10 is rejected under 35 U.S.C. §103(a) over Witham and Wu et al. (WO 00/50161). Applicants respectfully traverse.

Wu does not remedy the above-noted deficiencies in Witham. Rather, Wu is cited for allegedly describing a crosslinked acrylic coating having a pendant cationic group linked to the

coating backbone. No combination of Witham and Wu would teach or suggest Applicants' coated membranes as set forth in Applicants' independent claim 1. Claim 10 depends from claim 1 and, thus, also is patentable over Witham and Wu. Reconsideration and withdrawal of the rejection is respectfully requested.

Witham and Hou

Claim 11 is rejected under 35 U.S.C. §103(a) over Witham and Hou et al. (WO 00/50160, corresponding to U.S. Patent No. 6,783,937). Applicants respectfully traverse.

Hou does not remedy the above-noted deficiencies in Witham. Rather, Hou is cited for allegedly describing a crosslinked acrylic coating having fixed negative charge. No combination of Witham and Hou would teach or suggest Applicants' coated membranes as set forth in Applicants' independent claim 1. Claim 11 depends from claim 1 and, thus, also is patentable over Witham and Hou. Reconsideration and withdrawal of the rejection is respectfully requested

Charkoudian et al

Claims 50-57 are rejected under 35 U.S.C. §102(e) or alternatively §103(a) over Charkoudian et al (U.S. Publication No. 2003/0077435). Applicants respectfully traverse.

Charkoudian describes membranes coated with a polymeric terpolymer. Such polymeric terpolymers are coated thereon by contacting the surface of the membranes with a solution containing monofunctional and polyfunctional monomers, followed by polymerization.

As acknowledged by the Office, Charkoudian does not teach Applicants' difunctional acrylate mobomers. As such, Charkoudian does not teach or suggest Applicants coated membranes as set forth in amended claim 50.

Thus, claim 50, and all claims dependent therefrom, are patentable over Charkoudian. Reconsideration and withdrawal of the rejection is respectfully requested.

Remigy et al

Claims 50-57 are rejected under 35 U.S.C. §102(e) or alternatively §103(a) over Remigy et al (U.S. Publication No. 2002/0161066). Applicants respectfully traverse.

As acknowledged by the Office, Remigy does not teach Applicants' difunctional acrylate mobomers. As such, Remigy does not teach or suggest Applicants coated membranes as set forth in amended claim 50.

Thus, independent claim 50, and all claims dependent therefrom, are patentable over Remigy. Reconsideration and withdrawal of the rejection is respectfully requested.

CONCLUSION

In view of the above amendment, applicant believes the pending application is in condition for allowance.

It is believed that no fees are required for consideration of this response. However, if for any reason the fee paid is inadequate or credit is owed for any excess fee paid, the Office is hereby authorized and requested to charge Deposit Account No. **04-1105**.

Dated: November 19, 2008

Respectfully submitted,

By: /Lisa Swiszcz Hazzard/
Lisa Swiszcz Hazzard
Registration No.: 44,368
EDWARDS ANGELL PALMER & DODGE LLP
P.O. Box 55874
Boston, Massachusetts 02205
(617) 517-5512
Attorneys/Agents For Applicant